A. FORD.

Heating Apparatus.

No. 209,471. Patented Oct. 29, 1878.

Fig. 1.

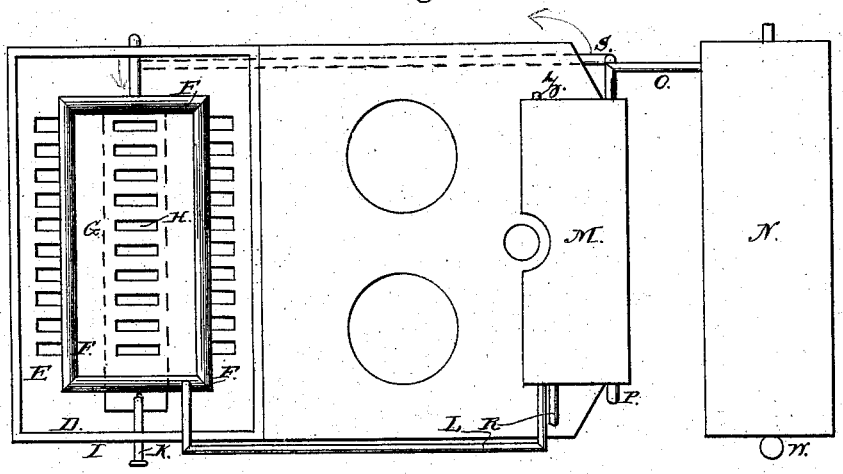
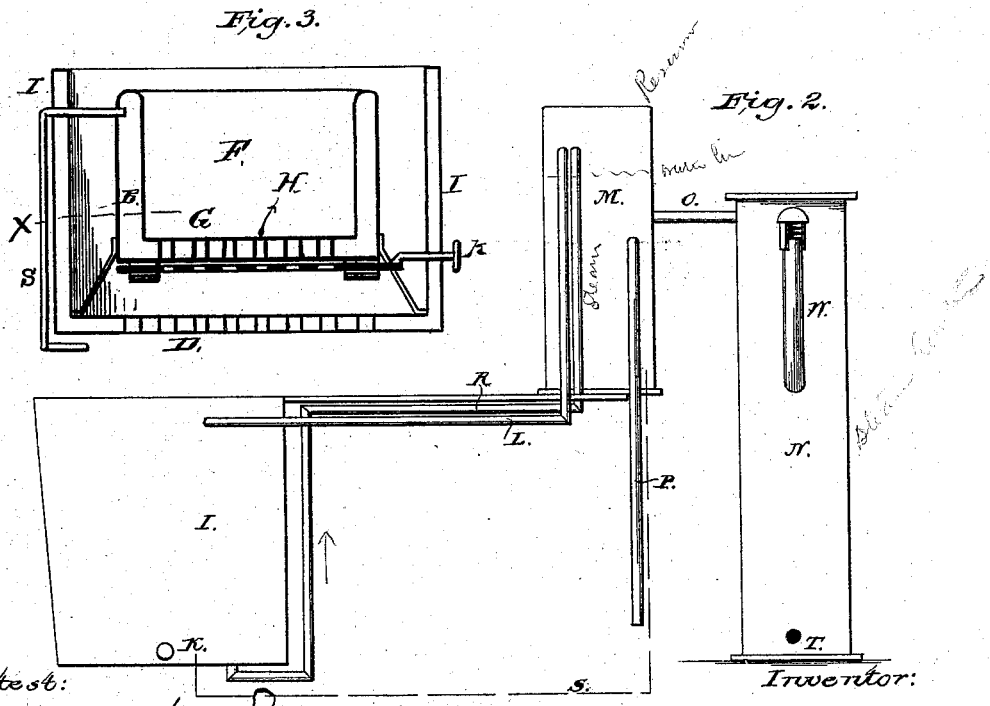


Fig. 3.

Fig. 2.



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ALVIN FORD, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN HEATING APPARATUS.

Specification forming part of Letters Patent No. **209,471**, dated October 29, 1878; application filed May 22, 1876.

To all whom it may concern:

Be it known that I, ALVIN FORD, of Chicago, in the county of Cook and State of Illinois, have invented a new and valuable Improvement in Apparatus for the Production of Heat; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures marked thereon.

Figure 1 is a top view of a stove or furnace and steam and water heater containing my improved apparatus. Fig. 2 is a side view of the same. Fig. 3 is a sectional view of my fire-chamber and water-reservoir, showing hollow grate-bars, which are a part of the same.

This invention has relation to improvements in apparatus for the production of heat; and it consists in the construction and novel arrangements of parts, as will be hereinafter more fully shown and described.

The letter I, Fig. 1, represents the exterior of the fire-chamber of a stove or furnace. D represents the bottom of the fire-chamber I, and is hollow throughout its length and breadth, to contain water. E represents the grate-bars of the bottom D, which are also hollow and adapted to contain water. F G H represent a supplementary or interior fire-chamber and water-reservoir resting on the bottom D aforesaid, which is placed on the fuel contained in an ordinary stove. This fire and water chamber F G H is provided with a damper, K, by means of which the spaces between the grate-bars can be closed and the draft can be completely or partially cut off from the same. The construction of this reservoir and fire chamber F G H is more particularly shown in Fig. 3.

P represents a pipe leading from the hydrant into the hot-water and steam reservoir M. The letter S represents a pipe for the purpose of supplying water to the hollow bottom D from the reservoir M and into the fire-chambers F G H. R is a steam-pipe opening out of the bottom D into the reservoir M at a point above the water in the same. O represents a steam-pipe opening out of the reservoir M into the steam-heater N. W is an automatic steam-valve, allowing the steam to escape from the steam-heater N when there is a certain pressure. T is a faucet, through which any condensed steam may at any time be drawn from the steam-heater N. Z is also a faucet, through which hot water may be drawn from the hot-water reservoir M. The entire exclusion of air from below the fire-chamber can be attained by means of the damper K, and fire may be retained in the fire-chamber *x* for a considerable length of time, thus giving a constant fire for warming or other purposes, and affording, by means of the surrounding fire and water reservoir F G H, a constant supply of hot water, and also largely economizing fuel.

The supply of water through the hydrant-pipe P is regulated by a float in the reservoir M, which closes a valve, shutting the water off from the hydrant-pipe when the water has reached a certain height in the reservoir.

The steam-radiator N may be placed in any room in the house, warming the same by means of the steam supplied through the pipe O from the reservoir M, the top of which is a steam-reservoir, and is supplied with steam through the pipes R and L directly from the fire and water reservoir F G H and the bottom D.

I regard as one of the useful features of my combination the hollow grate-bars E and H, Fig. 1. When containing water no heat can melt or burn away or seriously injure them. This is of great importance when an intense and constant fire is maintained in the grate, especially when the grate-bars are entirely surrounded by fire, as is shown in the fire-chamber *x*.

I will now describe the operation of my invention. The fire is kindled in the space between the walls F and bottom G of the interior fire chamber and the walls I and bottom D of the stove, and the said chamber F and space between the same are properly filled with fuel. The water entering the hollow bottom D and chamber F G H is heated, and by means of the pipes R and L it circulates through the reservoir M, heating the water therein and generating steam, which passes through pipe O to the heater N. By means of the damper K the draft may be shut off from the fire-box F G H completely or partially, so as to cause the fuel therein to burn slowly, in order to

maintain a fire within for a considerable length of time, in order to keep the water heated for domestic purposes.

What I claim, and desire to secure by Letters Patent, is—

1. The metal reservoir M, connected with the fire-box F G H and bottom D by means of pipes S R L, substantially as specified.

2. The combination of the fire and water chamber F G H, having hollow grate-bars and damper K, with the bottom D, substantially as specified.

3. The combination of the steam-heater N with the reservoir M, the reservoir F G H, and the bottom D E, substantially as specified.

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Witnesses:
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